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rounded by disease, apparently from two confluent lesions, one of which started about midway between cuts 4 and 5, but on the opposite side of the limb, while the other started near cut 5 and on the same side of the limb. Judging only from the size of these lesions, they must have originated soon after the inoculations were made. There was no evidence that any infection had started at cut 5. Cut 6 was uninfected. Cuts 7 and 8 showed sunken areas but no fans, pustules, nor other symptoms of the disease. Cut 9 had developed a girdling lesion 7 inches long with very many pustules. Cut 10 had developed a lesion 4½ inches long and 3 inches wide. Cuts 11, 12, 13 and 14 were uninfected. Cuts 15 and 16 had produced confluent girdling lesions aggregating 11 inches in length. This probably indicated that each cut had produced a lesion about 6 inches in length, as the cuts were about 5 inches apart. Cuts 17 and 18 were uninfected.

The results of these inoculations may briefly be summarized as follows:

- 2 inoculations from typical canker on bark, both successful.
- 2 inoculations from pustules on nut, both successful.
- 2 inoculations from mycelium on nut, one successful.
- 10 checks cut with sterile knife, none infected.
- 2 checks cut with contaminated knife, none infected.

These inoculations indicate that the disease was present on or in the nuts and burs collected. Although the latter were not used in the inoculations, the nuts and burs were covered with the same fungus, judging only from an examination with a hand lens; and, moreover, the nuts and burs were in contact when collected.

Perhaps nuts infected in this manner are not likely often to reach the market, and presumably would be unsalable either for seed purposes or for eating if they did reach it. In the latter case an additional source of danger would be created by discarding the diseased nuts, perhaps in a new locality far distant from the place where they were grown.

In any event, the possibility of the disease at times being disseminated through great distances in this manner can not be overlooked in summing up the evidence bearing on this phase of investigation.

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INTERGLACIAL MOLLUSKS FROM SOUTH DAKOTA

MR. W. H. OVER, of the University of South Dakota Museum, recently submitted for study a most interesting collection of interglacial mollusks. The material, consisting of wood, cones, shells, etc., in muck, were found in a well 20 feet below the surface, two or three miles north of Grandview, in Douglas County, South Dakota.

Professor James E. Todd thus refers to this material:¹

An Ancient Tamarack Swamp.—Near Grandview, in the southeast quarter of sec. 33, T. 100, R. 64, were found traces of more recent occupation of the region by trees. In a well which had been dug on the edge of a basin near a branch of Andes Creek at the depth of 20 feet was found a layer of muck several inches in thickness, in which were pieces of wood with numerous fresh-water shells of nearly a dozen species. But the most remarkable thing was the stem of a hemlock or tamarack about 10 inches in diameter lying across the well, and in the muck were numerous cones evidently of the same species. Overlying this trace of a tamarack swamp was mud of various colors and consistency, evidently washed from the surrounding hillsides. That it should be so deeply buried was chiefly explained by its connection with the channel of Andes Creek. This was conclusive evidence that the region had been occupied more or less by timber since the ice had covered the region, possibly while the second moraine was in process of formation. Similar finds are reported from wells several miles west of that place.

The overlying till here is Wisconsin, which varies greatly in thickness. The surface is yellow clay underlain by blue clay. The

¹ Bull. 158, U. S. Geol. Survey, p. 121, 1899.

former is Wisconsin while the latter is apparently Kansan. Professor Todd evidently correlates the deposit with the later Wisconsin when he says:

This was conclusive evidence that the region had been occupied more or less by timber since the ice had covered the regions, possibly while the second moraine was in process of formation.

The late work of the Iowa geologists, Calvin, Shimek and others, indicates that the underlying blue clay was laid down by the Kansan ice sheet, and hence the fossil remains must be regarded as post-Kansan and pre-Wisconsin.

From this new angle of view the fossils become of great interest. The mollusks were submitted by Professor Todd to Professor R. Ellsworth Call, who recognized the following species.²

Limnophysa palustris Say.

Limnophysa decidiosa Say.

Gyraulus parvus Say.

Valvata sincera Say.

Segmentina armigera Say.

But five species are here recorded, although Professor Todd refers to "nearly a dozen species."

In the material submitted by Mr. Over, which is a part of the original lot, fifteen species are recognized, as noted below:

Pisidium compressum Prime.

Pisidium variabile Prime.

Pisidium medianum Sterki.

Valvata tricarinata Say.

Valvata lewisii Currier.

Succinea avara Say.

Physa sp. (immature).

Galba palustris Müll.

Lymnaea stagnalis appressa Say.

Planorbis trivolvis Say.

Planorbis bicarinatus Say.

Planorbis bicarinatus striatus Baker.

Planorbis deflectus Say.

Planorbis parvus Say.

Planorbis exacuous Say.

Two species, *Segmentina armigera* and *Limnophysa* (*Galba*) *decidiosa*, mentioned by Call, were not detected in the material re-

² *Op. cit.*, p. 121, footnote. The old nomenclature is used.

cently examined. Thirteen species are likewise included which were not mentioned by Call, possibly because the material did not contain them. *Valvata sincera* as identified by Call also proves to be *Valvata lewisii*.

The fauna is thus seen to have been large and varied. The deposit was evidently the bed of a large lake or river, and could not have been a tamarack swamp as stated by Professor Todd, because mollusks such as *Valvata tricarinata* and *V. lewisii* do not inhabit such a station. The tamarack log and cones mentioned probably floated from the shore and became buried in the mud. That this fauna lived in or near the present Andes Creek is not at all possible, because such an assemblage of life would scarcely be found in this kind of a habitat.

With just which interglacial stage this biota is to be correlated is not yet clear. If it immediately preceded the Wisconsin, which seems probable, it may be Peorian (post-Iowan); or if it became extinct before this stage it may be the equivalent of the Sangamon (post-Illinoian); if it is to be classed as post-Kansan, as it lies upon the Kansan till, it must be correlated with the Yarmouth stage. In the absence of equivalent loess deposits it is difficult, if not impossible, to place this deposit in its true position in the paleontologic column. A restudy of the Grandview deposits from the modern, multiple glacial standpoint would assist greatly, doubtless, in solving this problem.

My thanks are due to Dr. Bryant Walker and Dr. Victor Sterki for kind assistance in the determination of doubtful material.

FRANK C. BAKER

THE CHICAGO ACADEMY OF SCIENCES

THE INDIANA ACADEMY OF SCIENCES

The Indiana Academy of Sciences and the Indiana Conservation Association met in joint session in Indianapolis, October 24-25. Some of the important papers were as follows:

President Donaldson Bodine's address on "How to Increase the Efficiency of the Academy."

"The Flood of March, 1913."

At Terre Haute, Charles R. Dryer.

At Fort Wayne, L. C. Ward.